

Van Gogh and Perception of Space

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The Asian Conference on Arts & Humanities 2021
Official Conference Proceedings

Abstract

Architects imagine and design space before it is constructed, whereas the Artist has the prerogative to manipulate the reality in the painting. The understanding of Van Gogh's work has been overshadowed by his mental illness which caused him to eventually take his life. By studying what is written by historians, watching documentaries and reading Van Gogh's letters to Theo (his younger brother), we identified some points in his life which may have triggered these issues. This research is an attempt to understand Van Gogh from an architect's perspective by analyzing his paintings using digital three-dimensional modeling. In these paintings, we analyze how he portrayed architecture such as his house, a church, the hotel in Paris where he stayed, the Café Terrace at Night, The Bedroom and the Asylum. Using architectural elements, he hinted possible dis-comfort towards his house, the church and even in hotel. The windows always dark or shut, not showing us what was inside these buildings. The 3D models showed us the reality contrary to Van Gogh's depictions. The research here is also an analysis of his feeling and how he represented those gradually through the distortion of architectural elements and space.

Keywords: Van Gogh, Space, Perception, 3D Modeling

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Introduction

Van Gogh's work created in the later stages of his life possess the power to completely captivate one's attention. The *Starry Night*, specifically, displays the finest play of turbulence and takes the viewer on a spatial roller-coaster which makes a person inquisitive about the complexity of the artist's mind. The phenomena that these paintings behold have even rattled the world of science. According to the Physicist Joe Luis Aragon of the National Autonomous University of Mexico in Queretaro, the work of Van Gogh has a pattern of light and dark that holds remarkable closeness to the mathematical structure of turbulence.¹

These swirling skies in the paintings like the *Starry Night* (See Fig. 1), *Wheatfield with the Crows* (See Fig. 2) and the *Road with Cypress and Star* (See Fig. 3), all carry with them the similar characteristic imprint of the turbulence. According to research, all these paintings were the product of Van Gogh's mental instability. Van Gogh is said to have suffered from psychotic episodes, hallucinations and minor fits. "We think that van Gogh had a unique ability to depict turbulence in periods of prolonged psychotic agitation," says Aragon. The possibility of a person suffering from various mental illnesses to create something that is so mathematically accurate- scientists have considered it a problem harder than quantum physics- is absolutely baffling. Such mathematical precision has yet not been seen in the work of any other artist whose paintings possess turbulence type swirls. It is only Van Gogh's work that shows Kolmogorov scaling in its luminance probability distribution.²

This research, which is done as an Undergraduate Thesis in Architecture would establish an intricate relation between art and architecture. One that should be explored and benefited from. In analyzing the phenomena that is Van Gogh through the rules of architecture, a new window of perspective is bound to be discovered. Architecture would serve as a threshold into the mind of Van Gogh and unfold the complexities of the world (as he perceived it).

Van Gogh: Birth and Early Life

On March 30, 1852, a son was born in the rectory at Zundert, he was named Vincent; he lived for only a few weeks. Exactly a year later, on the same date, another healthy son was born who was named Vincent Willem. Vincent had three more sisters and a brother named Theodorus (Theo), who had a great role in Vincent life. The grave of Vincent's elder brother, who was born a year before him was near the chapel where his father preached. His mother mourned for her first born immensely and often visited the grave accompanied by the young Vincent. Young Vincent may have carried an unconscious guilt of being a replacement for his elder brother.³ He must have seen his name on the grave and he being his brother's namesake; he must have felt that he was not good enough and when he died, he felt that he was a failure.⁴

What is perhaps lesser known that Vincent was devoutly religious and he considered everything that he did was an expression of his love for God. Even as a child, he was attracted to downtrodden and people of the earth. He drew and painted their lives; the fact that he suffered

¹ Peake, A (2016). *The Entranced, Opening the Doors of Perception – The Key to Cosmic Awareness*, Pg. 162

² Kolmogorov's work led to equations describing the probability of finding a particular velocity difference between any two points in the fluid. These relationships are called Kolmogorov scaling.

³ Auden, W.H. (1961). *Van Gogh A Self – Portrait Letters Revealing his Life as a Painter*, Pg. 7

⁴ Meyers, B. *Seeing with Holy Eyes: The Life and Art of Vincent Van Gogh*. Accessed online 27 May, 2021 <https://www.yumpu.com/en/document/view/7175509/seeing-with-holy-eyes-the-life-and-art-of-vincent-van-gogh>

immensely in his life, which left him wounded internally, he felt very compassionate to others. He was often described as moody, solitary and a difficult child who looked older than his age. He was a devout Christian and that too from an early age but he was an avid reader who learned French, German and English fluently, in addition to his native language. His mental illness, along with his sense of failure, that persisted throughout his life led him to commit suicide at the age of 37.

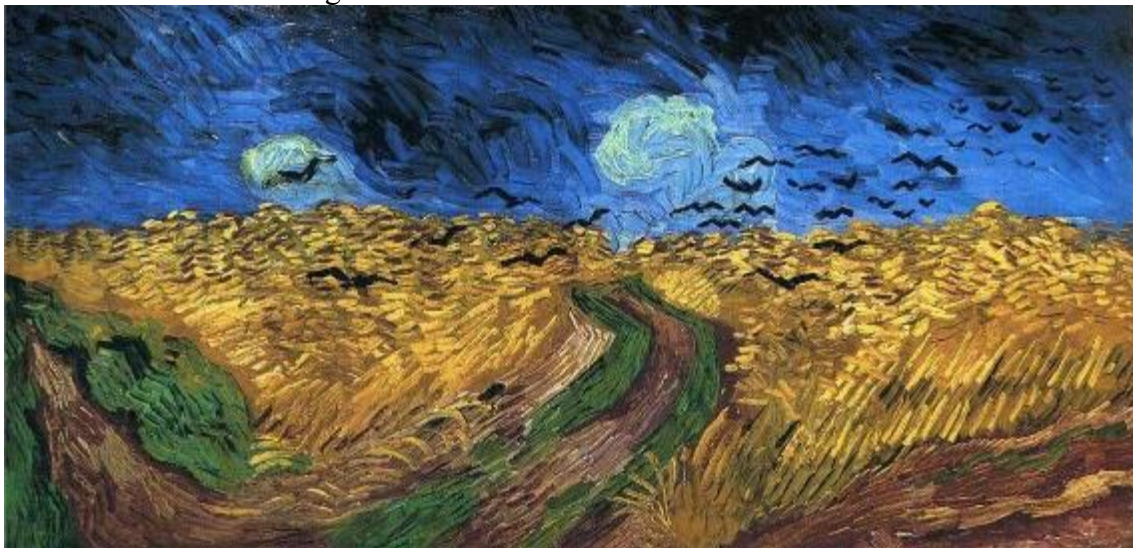
Figure 1. The Starry Night, 1889



Figure 2: Road with Cypress and Star – 1890



Figure 3: Wheat Fields with Crows – 1890



Architectural Analysis of Van Gogh's Selected Paintings

During the study of Van Gogh's work, there were some common aspects that were noticed in the way he painted buildings. There are three very notable buildings types that he painted frequently: cottages, churches and his Asylum. He also painted some city's views from his window when he moved to Paris but we will discuss the former. In his work, Van Gogh painted the cottages very gloomy, dark and unwelcoming. (See Fig. 4) It is said that in his earlier work, he used very earthly tones and possibly the sun was very scares but the cottages are painted so dark that it is as if Van Gogh does not want to you enter them. The same can be said about the Churches that were painted by him. Despite being a very religious person, who went out of the way to help or look out for poor and desolate people. Vincent had also tried to become a preacher but due to his methods, he could not get through the program. As mentioned earlier,

Van Gogh felt uneasy, possibly guilty and very mature for his age in his early childhood as well. A possible guilt of being a replacement for his dead older brother caused. It would be just to say that Van Gogh had some inner conflict with both institutions, home and church.

The religious institution of church, which is meant to be warm and welcoming is also painted dark, isolating and extremely gloomy. If we look at the windows in both types of buildings, they are all blacked out and there is no way in which we get any glimpse of anything from outside. (See Fig. 5) There is no light that can be seen in these buildings. It is as if Van Gogh only wanted to show the outer surface, the façade and not letting anyone inside these buildings; much like himself. The only time when he painted a building with bright colours and views from windows was mainly in the Asylum. (See Fig. 6) By this time, Van Gogh was much more mature in his style of painting but his paintings from the Asylum had more colour, life and warmth. Van Gogh also made his most notable works from the window in room of the Asylum. All this can be perplexing as if it seems that he was far more comfortable in the Asylum than he felt at home or with the church.

Figure 4: Cottages Painted by Van Gogh



Figure 5: Churches Painted by Van Gogh



Figure 6: Paintings of Saint Paul's Hospital – The Asylum where Van Gogh was treated for his Mental Illness



Some paintings were selected to analyze the architecture and the setting of the painting in detail. Three – dimensional digital models were made to study the Space, Light and Perspective in the paintings. All the models were made in Google Sketchup and placed in correct Geo - location to get accurate mapping of the light conditions and the environment so, for example, the model of 'Vicarage at Neunan' was digitally placed in the same place as the original building in Nuenan. In order to study the course of evolution that came in the space and layout of buildings in his paintings, we singled out paintings from different phases of the artist's life and analyzed then use of *Perspective* in his work and the elements in the *Foreground*, *Background* and *Middle-ground*, and how the architectural elements have been used to enhance the visuals and the meaning behind the painting.

Van Gogh and Perspective

Van Gogh himself was well read about the use of perspective and he explored its use in paintings, a very strong example would be of the rooftops that he painted in 1882, *View from the Ateliers*, (See Fig. 7). Artists have often used different methods to perfect the *perspective* in their paintings. There are several techniques for creating a rectilinear perspective; one concept which is expressed in a sketch by Durer. Rectilinear projection has its drawbacks; wide angle views show extreme distortion around its periphery.⁵ The concept sketched in Durer's sketch has a rectangular frame with the same proportions as the canvas is suspended in front of the artist, this frame is strung with a square grid made from the fine thread, a grid with the same proportions is also drawn on the canvas by the artist. Artist needs to keep their eye in same position and draw one box at a time and they will recreate the true rectilinear perspective. Usually, these apparatus includes an eyepiece or a fixed pin so that the artist can keep the same eye level. (See Fig. 8)

Figure 7: View from the Ateliers – 1882



Figure 8: De Symmetria and Underweysung der Messung, Albrecht Dürer (1532).



An alternative perspective machine, the rectangular frame and adjustable eyepiece are the same as Figure 8, however, instead of drawing directly on a sheet of glass placed in the frame, a square grid is strung in the frame and duplicated on the paper where the final picture is drawn.

⁵ Postle. B, Sharpless. T K, German. D M, (2011), The Perspective Machine of Vincent van Gogh.

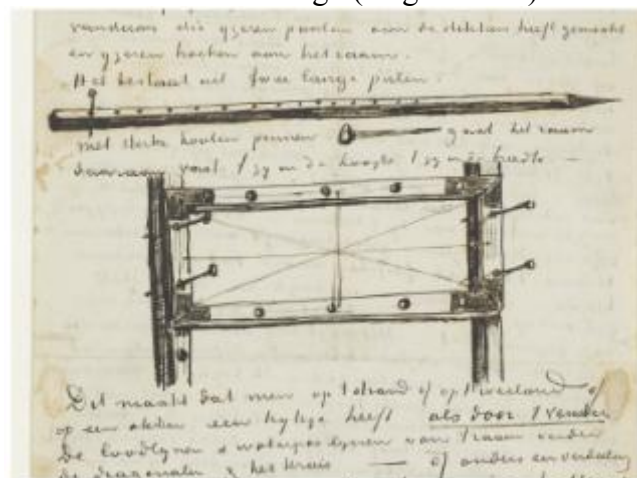
Van Gogh had two custom perspective frames built in 1882 and he wrote about them to Theo along with sketches that showed the Frame and how Van Gogh was using it. In his letters he wrote to Theo he explains about them:

Letter 235, June 1882

"I had more expenses in connection with the study of perspective and proportion for an instrument described in a work by Albrecht Durer and used by the Dutchmen of old. It makes it possible to compare the proportions of objects close at hand with those on a plane further away, in cases where construction according to the rules of perspective isn't feasible. Which, if you do it by eye, will always come out wrong, unless you're very experienced and skilled. I didn't manage to make the thing the first time around, but I succeeded in the end after trying for a long time with the aid of the carpenter and the smith. And I think that with more work I can get much better results still."

Two month later, Van Gogh made a second version of the frame and he sent Theo a sketch of himself using the perspective frame; there was no eye piece but the frame was positioned at eye-level (See Fig. 9 and 10). Van Gogh abandoned the use of perspective frame about two year later⁶ and possibly the grid was used in the same basic way as with the other traditional perspective frames. There has been some analysis done on the representation of the perspective that he has used in his paintings. In the following paintings, we would be looking at the use of perspective in the buildings that he had painted to see if there was any shift in the way he painted space.

Figure 9: Detail Sketch of Perspective Frame Showing Grid, Letter 254 to Theo Van Gogh, Vincent Van Gogh (August 1882).



⁶ Postle. B, Sharpless. T K, German. D M, (2011), The Perspective Machine of Vincent van Gogh

Figure 10: Sketch of Perspective Frame in Use, Detail, Letter 253 to Theo Van Gogh, Vincent Van Gogh (August 1882).



Selected Paintings

The following painting were selected and analyzed from an architectural perspective and their space was reconstructed in Google Sketchup. Each painting had a different or comparable outcome and they will be discussed separately.

1. Vicarage at Nuenen, 1885

The cottage painted here is the house of Vincent Van Gogh was born. In a movie *Loving Vincent*, there are two particular important scenes that related to this house (See Fig. 11). In the first set of clips, we see young Vincent playing by the Window when his mother leaves the house without even tell him. Seeing his mother outside, he runs to follow her and attempts to hold her hand which she shrugs away. They head towards the cemetery where his infant elder brother is buried; the tomb stone bearing his own name. The burden of seeing the grave must have been immense on the young Vincent who could have felt very uncomfortable in the house without the love of his mourning mother. The second set clip is when Vincent is seen coming home after he failed to secure a proper job. Through the same window, we see him feeling embarrassed and disappointed with a fear of the confrontational conversation which he would have with his parents. (See Fig. 12)

Figure 11: Scene from Movie *Loving Vincent*



Figure 12: Scene from Movie *Loving Vincent*

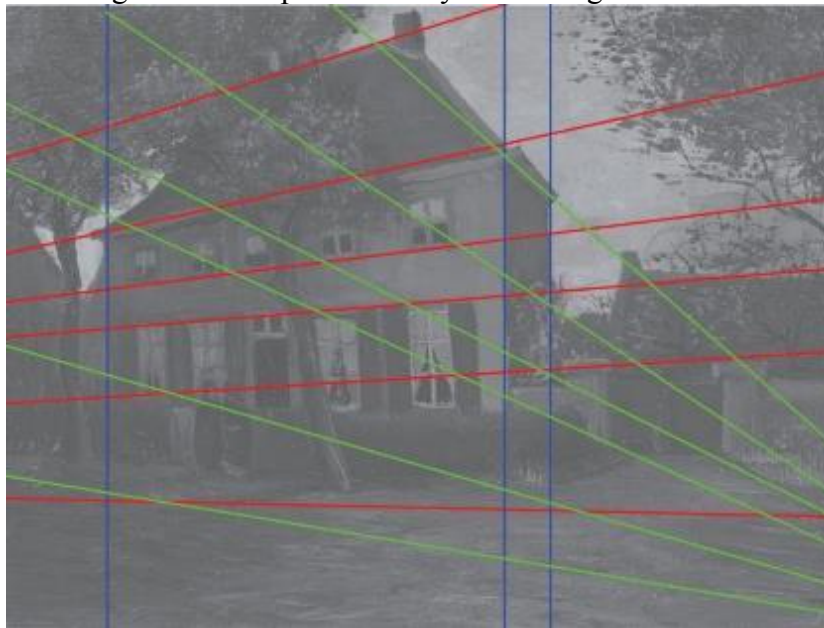


When he painted the Vicarage, he painted it very dark, gloomy and unwelcoming. The eye falls upon the foreground which consists of cottage thick foliage that acts as a screen between the house. The barren cold ground takes up almost 1/3 of the image with closed doors and blacked out windows. The sky in the background is also very pale which is also hidden behind the thick foliage of Autumn (See Fig. 13). The building itself stand up tall and at this point, Van Gogh's skill had improved and the perspective used in the image seems to be precise (See Fig 14). It is a perfect uniform perspective which indicates that Van Gogh at the beginning of his painting profession was determined to learn and perfect his skills on the road to becoming a great artist. The style of the brush strokes suggest that he was careful while he painted as he needed to prove to the world that he was worthy of becoming a professional painter.

Figure 13: Vicarage at Nuenen, 1885



Figure 14: Perspective Study on Vicarage at Nuenen



At this point, we had noticed that Vincent was painting windows black to not let the viewer get any glimpse of the interior space. We re-constructed the Vicarage in Google Sketchup and placed the model Geographically in the same location as the original. We tried out the different lighting conditions especially recreating the same time that Vincent had showed in the painting. What we found was that not only did Light would penetrate the windows, we could see inside as well. Therefore, he was deliberately painting them black to conceal the inside. It can be said that this was a conscious but psychological decision. Vincent had been uncomfortable in his home and he was covering up the place that housed so many of his memories and he did not want anyone to see anything inside, of the house and himself. (See Fig. 15)

Figure 15: Studies Done on the Light Condition on the Vicarage at Nuene Using Google Sketchup



2. Church at Auver, June 1890

The *Church at Auver*, was done much later in the timeline of the paintings and by this time, Van Gogh was very comfortable with his style of painting and the choice of colours. The painting is equally divided between the earth and sky. The foreground shows the path being divided into two that seem to be disappearing into the building of the Church. The stroke of his

brush are giving a sense of motion to the threshold leading towards the church (See Fig. 16). The sky that he painted is the same cobalt sky that he painted in the *The Yellow House* but this time his brush strokes are in a circular motion which makes it distinct from his earlier paintings made in Arles. Secondly, this Cobalt blue sky is actually a 'Night – Time' sky but Van Gogh juxtaposed the Night sky with a Day time ground. In the painting, we see the church having a very distinct shadow which is possible during the day but the sky belongs to the night.

If the church is looked upon devoid of the ground and the sky, (See Fig. 17), it gives a very erring and again an extremely unwelcoming feeling about the building. There is no light shown within the building and the windows are again very dark. As mentioned before, one imagines a religious building to have warmth that any sacred space would have but instead, the building seems to be melting into the ground as if the building is not solid anymore. If the same conclusion is drawn about the church stating that Van Gogh would have been in conflict with the institution of the Church, it would be very surprising as he himself was a very humble and religious man. He did have a very un-orthodox view of the religion and maybe the fact that he could not become a Preacher, like his father, Vincent held some resentment against the institution (Church). This could have been his personal commentary about the institution of Church but not the Religion in itself as he himself was a devout follower. Figure 18 and 19 shows the perspective study of the building and the painting and the model overlapped to show the difference in their rendition.

Figure 16: Church at Auvers, 1890

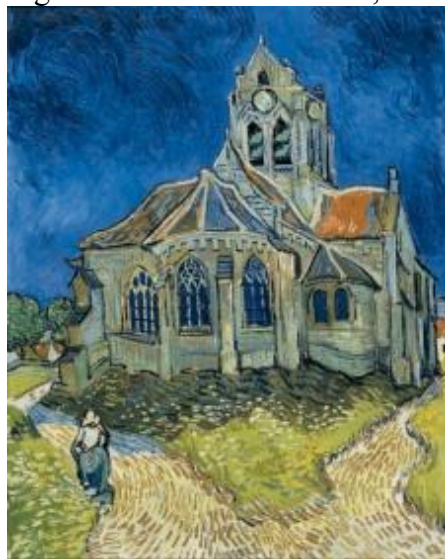


Figure 17: Church at Auvers Devoid of Colour in the Foreground and Background



Figure 18

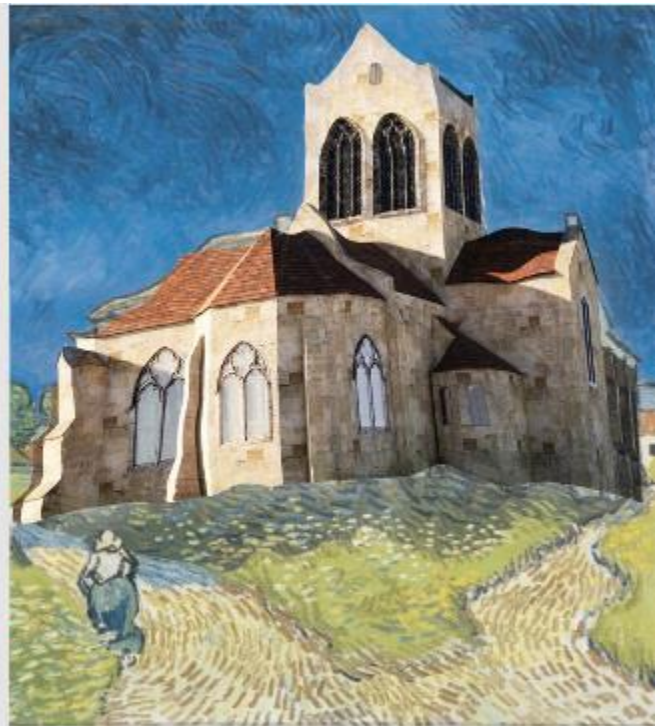
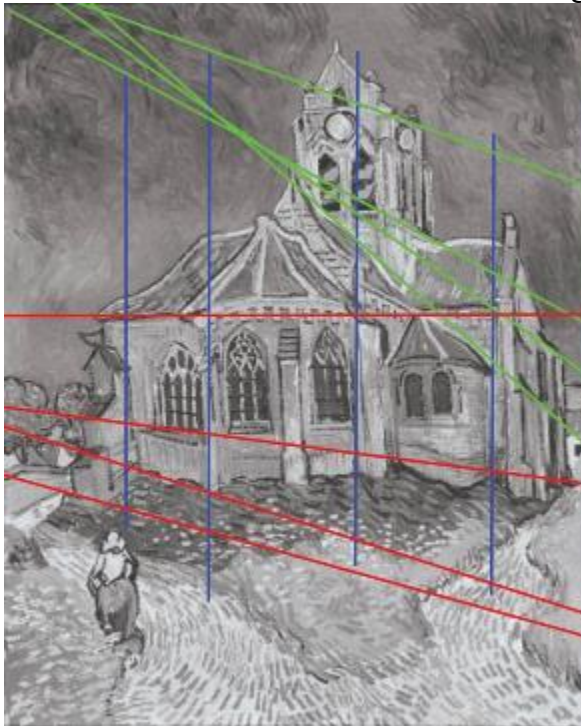
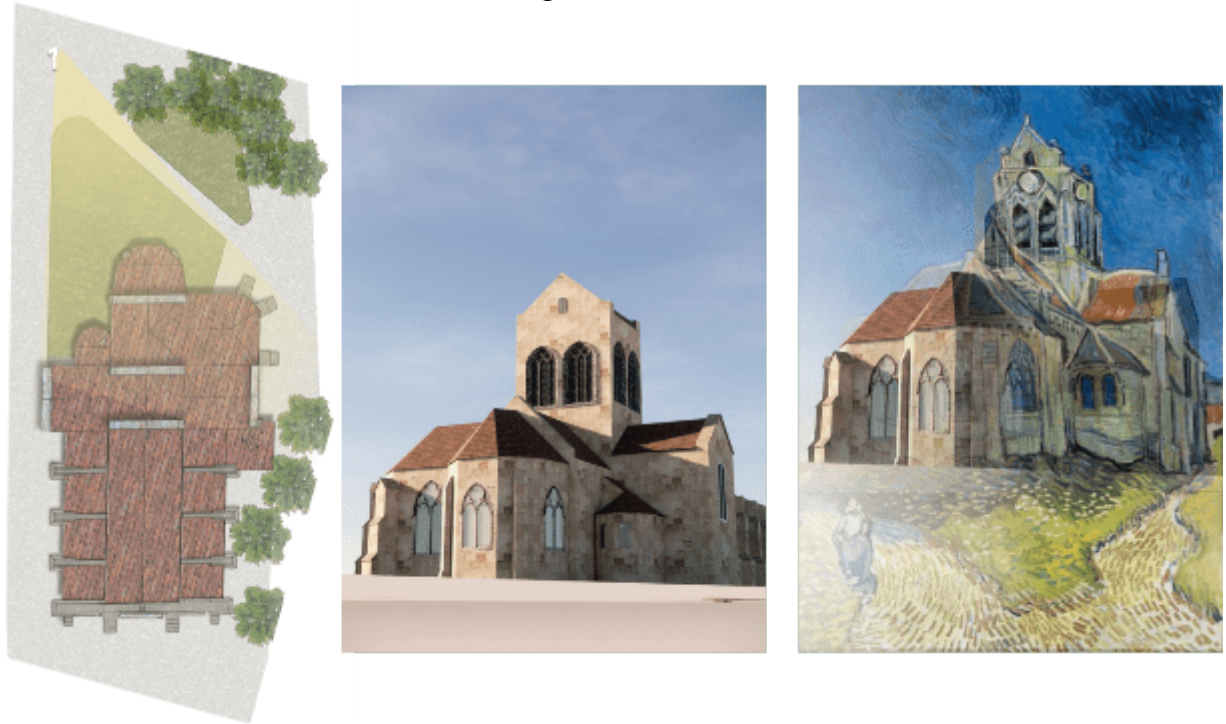


Figure 19



3. Terrace Café at Night, 1888

There are three prominent starry night views that were painted by Van Gogh: *The Starry Night*, *Starry Night over Rhone* and *Café Terrace at Night*. These night views have been more alive than some of his exceptional day renderings. The *Café Terrace at Night* shows a view of a Café on the edge of the street under a very bright yellow light and a signature blue sky with stars (See Fig. 20). There are few people seated with one standing figure serving the customers. The whole painting is charged with energy; in the foreground the street is full of colour and it extends to the back of the painting. The painting is asymmetrically divided between the café and the buildings. There is a glimpse of the tree in the foreground with a small area of the sky visible in the background. In our analysis we found that the stars in the painting correspond to the number of tables in the painting. The perspective in the painting is set to focus at the vanishing point behind the central figure standing in the Café. However, the size of the doorways and the chandelier is humongous if compared with the size of the people. (See Fig. 21 and 22)

In recent research by Jared Baxter, a new theory was proposed that this painting was in fact Van Gogh's rendition of the 'Last Supper'.⁷ He proposed that there are twelve figures in the café with one shadow leaving, indicating Judas. The central figure is Jesus in which tunic; the vanishing point focuses on him and there is a hint of the cross behind him as the window. The reconstruction of the model was to confirm the perspective and the variation in the scale but later we decided to experiment in the model. See Fig. 23

⁷ Baxter, J, 2016, Why Vincent's Café Terrace at Night is a Symbolist Last Supper: Part 2 of 2. Visited on 1 June, 2021. <https://think.iafor.org/vincent-s-cafe-terrace-night-symbolist-last-supper-part-2-2/>

Figure 20: Café Terrace at Night

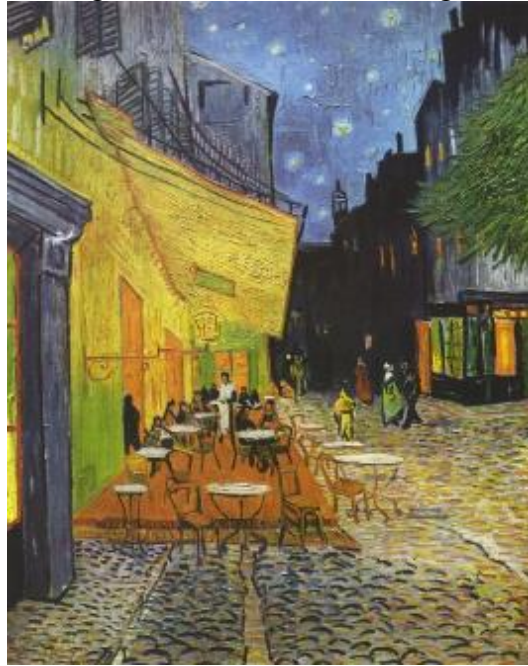


Figure 21: The Alignment of the Stars with the Tables at the Café



Figure 22: The Perspective and Scale in the Café Terrace at Night

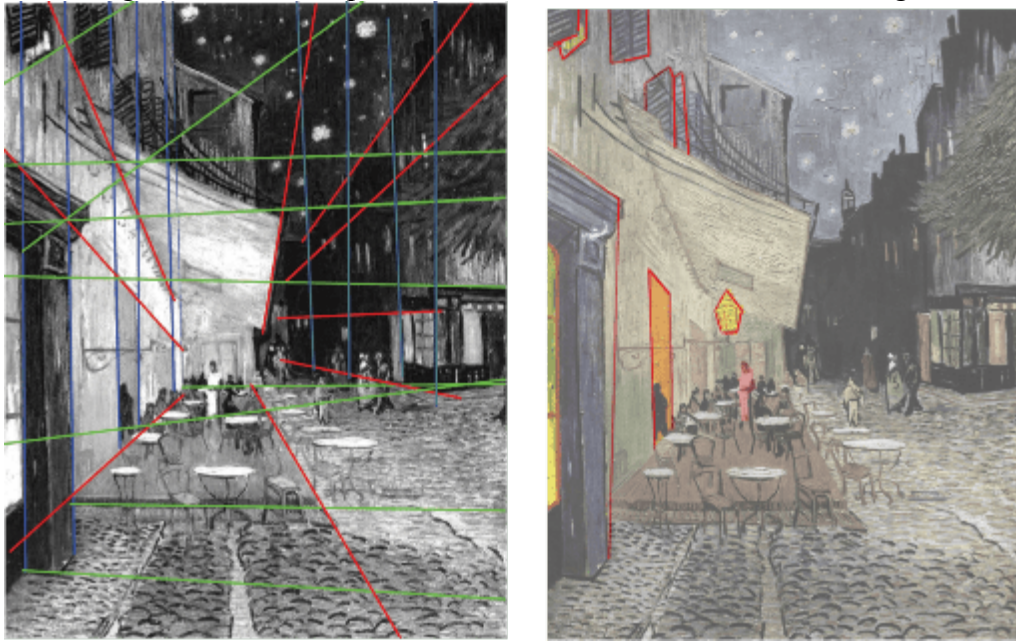


Figure 23: Jared Baxtor Research about the Café Terrace at Night as the Last Supper

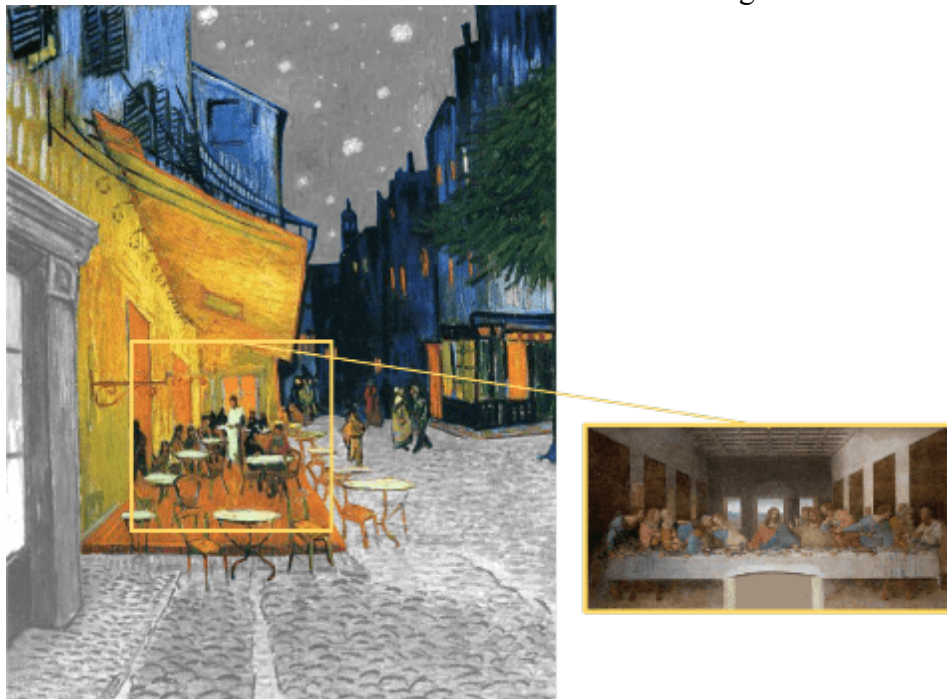


Figure 24: The Model Showing the Correct Perspective of the Café



4. Yellow House, 1888

Vincent saw the Yellow House as a fellowship of the artists and he had high hopes for this project. He rented the Yellow House in the spring of 1888 and Gauguin joined him for a while up until their arguments two months led to Gauguin leaving the Yellow House and Vincent cutting his own ear. Vincent wrote to Theo about his troubled relation in letter 565:

“I believe that Gauguin was disheartened with the good city of Arles, with the small yellow house where we worked and especially with me. In fact both of us had difficulties to overcome. But these difficulties are inside us, not outside. I truly believe that he will either leave forever or stay forever.”

Van Gogh has aimed to keep a balance between both the ground and the sky in this painting. It is as if both are a reflection on one another. Perhaps this balance between the two reflects the balance within Van Gogh himself now that he was at peace with his work at this point in life. But there are more layers to the paintings as we look deeper. The perspective is set to a two-point perspective, highlighting the Yellow house making it the center of attention. The house has been painted bright yellow against the blue sky. Like most of his previous painting, Van Gogh put very subtle hints in his paintings about what he felt about himself. The green windows of the house may seem very welcoming but a closer look shows the same black interior and the window of his room being shut. The darkness in the windows is the only thing that makes its connection to Van Gogh's past life and hold its similarity to the windows of the *Vicarage in Nuenen*. See Fig. 25 and 26

Figure 25: The Yellow House, 1888

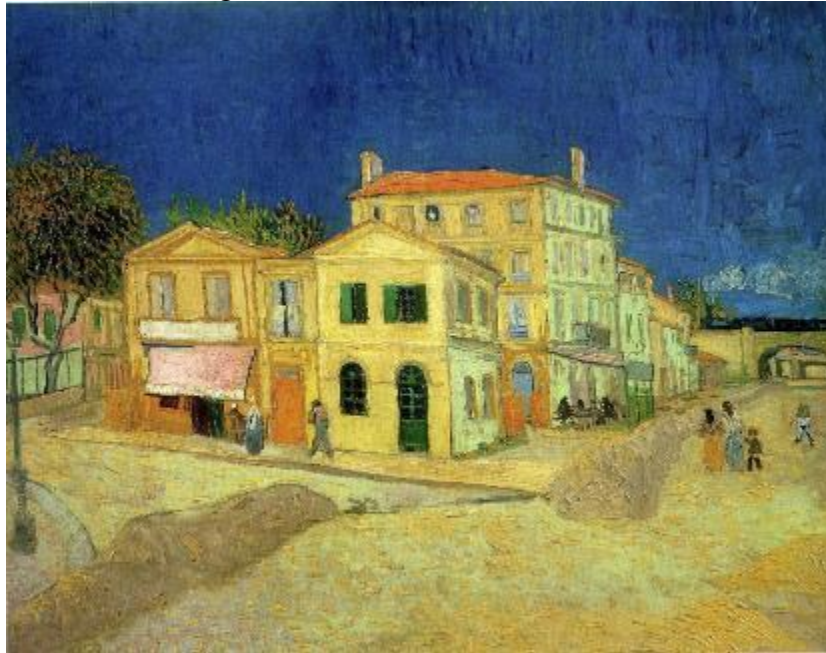
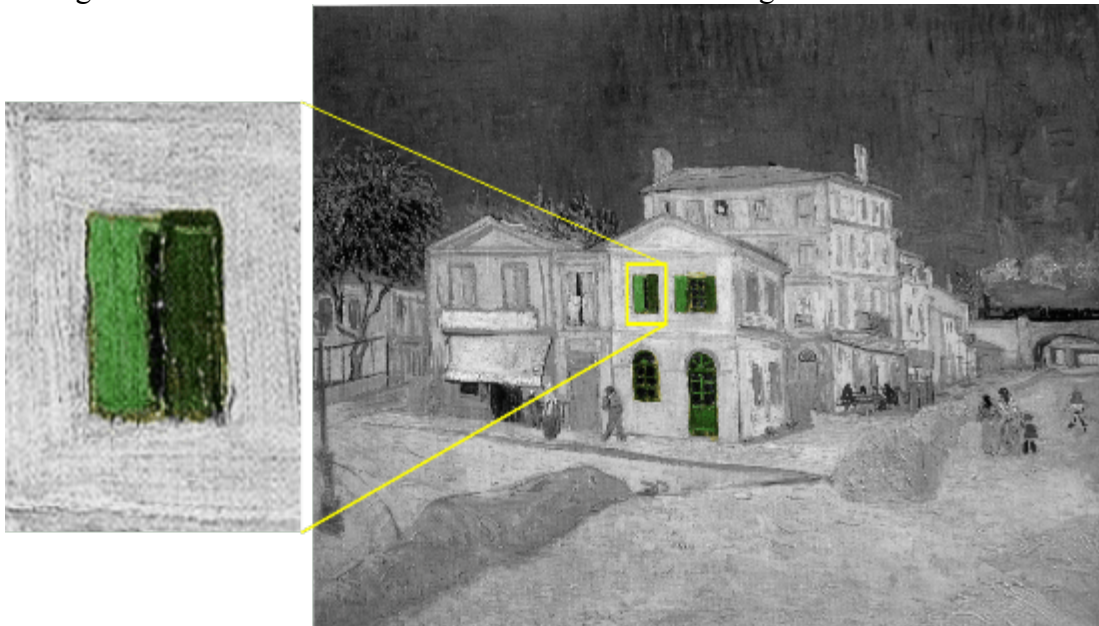


Figure 26: The Detail of the Closed Window of Van Gogh's Room in the Yellow House



5. The Bedroom, 1889

Of all the renditions of interior space *The Bedroom in Arles* is a remarkable painting and one of the best-known works. Van Gogh loved the painting so much that he made two sketches and three oil paintings of the same scene. He mentioned the work in about fifteen letters and expressed his satisfaction about the work several time.⁸ (See Fig 27)

When I saw my canvases again after my illness the one that seemed the best to me was the Bedroom. (Letter 573)

⁸ Hendriks. E, (2011), A Comparative Study of Vincent van Gogh's Bedroom Series, Studying Old Master Paintings: Technology and Practice, M. Springs, Pg. 273

At first it seems like a normal flat painting of a room with minimal amount of furniture but the use of colour makes the eye move along the thick outlines of the objects in the room. The entire room is animated by the use of colour and exaggerated perspective of what could be otherwise very ordinary furniture or room. Van Gogh also knew the use of colour well enough to make this image so striking but in this series, he completely removes shadows and cast shadows, he even mentions this approach in a letter:

'The shadows and cast shadows are removed; it's colored in flat plain tints like Japanese prints'
(letter 705)

Figure 27: The Bedroom Series and the Sketch Sent in the Letter to Paul Gauguin



What is unusual about this painting is the exaggerated perspective of the bed but did Van Gogh unconsciously also curb the perspective of the Bedroom to make it look very flat. Like all the paintings that were selected, a model was made for this painting as well but we broke down the perspective in the following study. When we drew lines on the painting, we found three sets of perspective and a viewing position of that perspective (See Figs 28, 29, 30, 31 and 32). The final visual shows the three different perspective together; they all give a different view and morphing them into one singular image gives that the impression of the room being actually crooked. This is entirely possible because of the street condition and sharp turns; the house can have an angular wall. Van Gogh did not paint the room in an angle but his furniture was painted using different viewing frames or levels making the room look like a regular rectangular room.

Figure 28: Bedroom in Arles through Perspective 1



Figure 29: Bedroom in Arles through Perspective 2



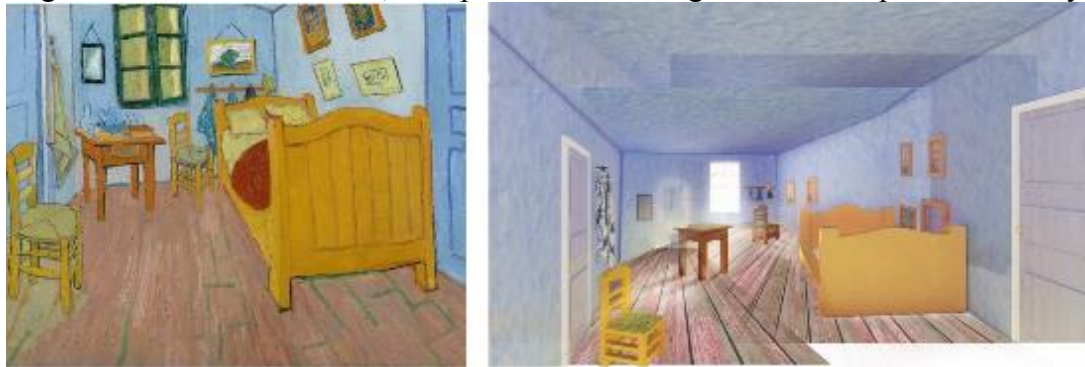
Figure 30: Bedroom in Arles through Perspective 3



Figure 31: Bedroom in Arles Perspective Overlay – The Room Looks Crooked



Figure 32: Bedroom in Arles, Comparison of Painting with the Perspective Overlay



In another research we found out that the Pannini perspective grid maps on the *The Bedroom in Arles*. “A Pannini perspective grid is illustrated, this has a 10 degree spacing, notice that that radial lines are equally spaced, vertical lines are straight and vertical, but the spacing increases away from the centre, horizontal lines bow as is necessary to maintain low local distortion. This grid can be overlaid onto the artist’s work, both *The Bedroom in Arles* and *The Night Café* paintings can be closely matched to the Pannini grid, infact it is possinle to read the angle-of-view of both painitngs, the first is 65 degree and the second is 110 degree.

We don’t have any evidence that Van Gogh’s frame was used in wither of these paintings, indeed we don’t know if it was ever modified to be suitable for use on a hard floor.”⁹ (See Figs. 33 and 34)

⁹ Postle. B, Sharpless. T K, German. D M, (2011), *The Perspective Machine of Vincent van Gogh*.

Figure 33: The Panini Grid and Overlay on Bedroom in Arles¹⁰

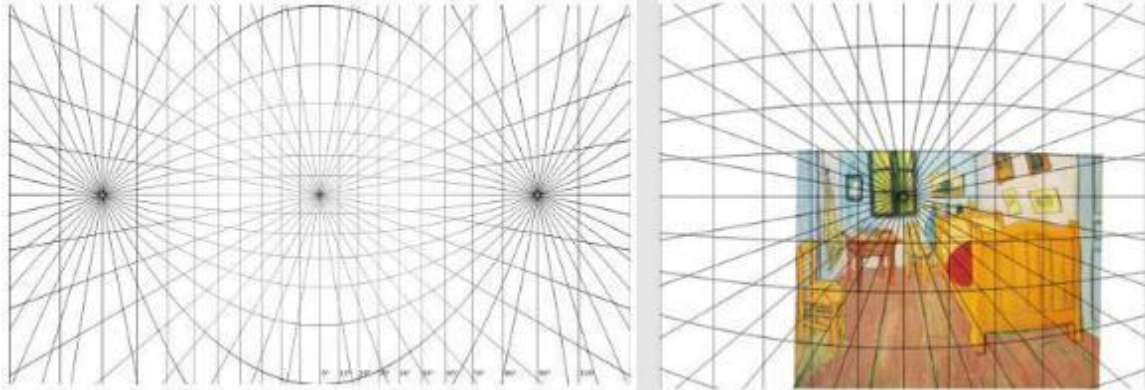


Figure 34: The Reconstruction of Bedroom by TODO¹¹

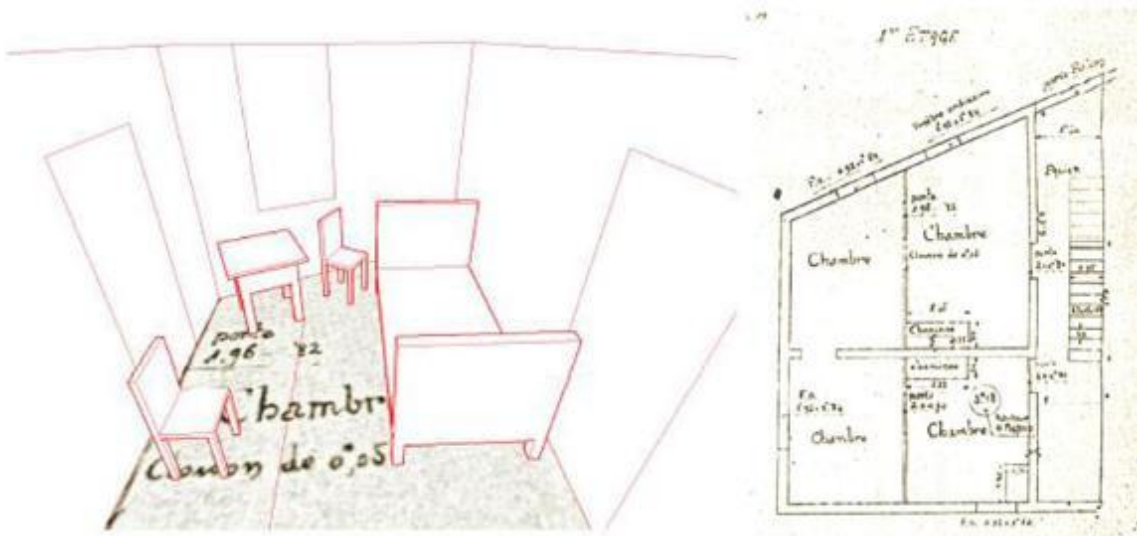


Figure 35: Comparison of Our Work with the Research by TODO



It is difficult to deduce what exactly was going on in Van Gogh's mind and whether it was his mental state or a genius that people could not understand at that time; if we compare both research done by us and the one shown in the paper "Van Gogh and Perception of Space". Both show similar outcomes using different methods. The room was crooked but Van Gogh manipulated the reality in his painting. (See Fig. 35)

¹⁰ Postle. B, Sharpless. T K, German. D M, (2011), The Perspective Machine of Vincent van Gogh.

¹¹ Postle. B, Sharpless. T K, German. D M, (2011), The Perspective Machine of Vincent van Gogh.

6. Window of Vincent's Studio at the Asylum, 1889

In 1889 Van Gogh had started having more frequent episodes of fits and had to get admitted in the Asylum of Saint Paul where the artist's only request was to be allowed to paint since it was the only thing that kept the fits at bay. He converted one of the spare rooms in the asylum into a studio where he would paint. The room only consisted of one barred window which is seen in the painting. Van Gogh painted masterpieces while he was at the asylum, one of which was the famous *Starry Night*. *Starry Night* in particular has been said to be made purely from imagination.¹² Which meant that Van Gogh's imagination had peaked while he was admitted in the asylum because of the mental state of his mind. Another painting that Van Gogh made which holds great meaning is the *Wheatfield with the Reaper*, painted through the same window. Van Gogh said that the wheat field and the reaper reminds him of the eternal life. The wheat field is the humanity that's being reaped. He thought it ironic to be looking at the scene of life and freedom before him as he sat behind the barred window of the asylum.

Vincent Van Gogh was mainly confined in this studio at his time at the Saint Paul Hospital which had just one window looking into the world outside. But what's important is that by this time Van Gogh's imagination was at its peak along with his mental illness. It's quite possible that Van Gogh's vision of the world was projected very differently from the reality. The visuals represent how Van Gogh's mind must have morphed the view from that window to create phenomenal paintings during his stay. See Figs. 36, 37 and 38

Figure 36: The Studio Is Saint Paul and the Plan Reconstructed by the Authors



¹² One of the biggest points of interest about this painting is that it came entirely from Van Gogh's imagination. None of the scenery matches the area surrounding Saint-Paul or the view from his window. As a man who religiously paints what he sees, it's a remarkable break from Van Gogh's normal work.

Figure 37: The Imagination of the Room Rendering with Van Gogh's Masterpieces



Figure 38: Visual Created to Imagine What Van Gogh Must Have Seen through His Asylum Window



Conclusion

The painting that we analyzed using Architecture showed how the reality was morphed in the paintings. Arguably, anyone can state that Van Gogh was not painting realism but when he was painting architecture or otherwise, he was trying to establish himself as a prominent artist. He was well read and knew about colour theories and used devices like his perspective machines. So in most of his work, he left subtle hints or symbols that may have been closely linked to his mental state. He was not good at expressing himself verbally but did so in his paintings and letter.

We focused on buildings because we saw the blackened out windows in a large portion of his work. That was the beginning point and it led to our discoveries about the *Bedroom in Arles*. The bedroom shows that Van Gogh was deliberately morphing the space or his sense of space

was impacted by his mental state. A deeper study of Van Gogh's more work would help us better understand the co-relation of his perception of space to that painted on his canvas.

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